

SEQUENCE LISTING

<110> Rybak, Susanna M.
 Newton, Dianne L.
 The United States of America
 as represented by The Secretary of the
 Department of Health and Human Services

<120> Recombinant Anti-Tumor RNase

<130> 015280-343100US

<140> US 09/622,613
 <141> 2000-08-17

<150> US 60/079,751
 <151> 1998-03-27

<150> WO PCT/US99/06641
 <151> 1999-03-26

<160> 43

<170> PatentIn Ver. 2.0

<210> 1
 <211> 312
 <212> DNA
 <213> Rana pipiens

<220>
 <221> CDS
 <222> (1)..(312)
 <223> ribonuclease (RaPLR1)

<400> 1
 caa gac tgg ctt acg ttt cag aag aag cac ctg aca aac acc cgg gat 48
 Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg Asp
 1 5 10 15
 gtt gac tgt aat att atc atg tca aca aac ttg ttc cac tgc aag gac 96
 Val Asp Cys Asn Ile Ile Met Ser Thr Asn Leu Phe His Cys Lys Asp
 20 25 30
 aag aac act ttt atc tat tca cgt cct gag cca gtg aag gcc atc tgt 144
 Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile Cys
 35 40 45
 aaa gga att ata gcc tcc aaa aat gtg tta act acc tct gag ttt tat 192
 Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe Tyr
 50 55 60
 ctc tct gat tgc aat gta aca agc agg cct tgc aag tat aaa tta aag 240
 Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu Lys
 65 70 75 80
 aaa tca act aat aca ttt tgt gta act tgt gag aat caa gct cca gta 288
 Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro Val
 85 90 95

cat ttc gtg ggt gtc gga cat tgc
 His Phe Val Gly Val Gly His Cys
 100

312

<210> 2
 <211> 104
 <212> PRT
 <213> Rana pipiens

<400> 2
 Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg Asp
 1 5 10 15
 Val Asp Cys Asn Ile Ile Met Ser Thr Asn Leu Phe His Cys Lys Asp
 20 25 30
 Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile Cys
 35 40 45
 Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe Tyr
 50 55 60
 Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu Lys
 65 70 75 80
 Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro Val
 85 90 95
 His Phe Val Gly Val Gly His Cys
 100

<210> 3
 <211> 312
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana pipiens
 ribonuclease with Met23Leu substitution
 (recombinant RaPLR1 Met23Leu)

<220>
 <221> CDS
 <222> (1)..(312)
 <223> RaPLR1 Met23Leu

<400> 3
 caa gac tgg ctt acg ttt cag aag aag cac ctg aca aac acc cgg gat 48
 Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg Asp
 1 5 10 15
 gtt gac tgt aat aat atc ctg tca aca aac ttg ttc cac tgc aag gac 96
 Val Asp Cys Asn Asn Ile Leu Ser Thr Asn Leu Phe His Cys Lys Asp
 20 25 30
 aag aac act ttt atc tat tca cgt cct gag cca gtg aag gcc atc tgt 144
 Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile Cys
 35 40 45

aaa gga att ata gcc tcc aaa aat gtg tta act acc ttt gag ttt tat 192
 Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Phe Glu Phe Tyr
 50 55 60

ctc tct gat tgc aat gta aca agc agg cct tgc aag tat aaa tta aag 240
 Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu Lys
 65 70 75 80

aaa tca act aat aca ttt tgt gta act tgt gag aat caa gct cca gta 288
 Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro Val
 85 90 95

cat ttc gtg ggt gtc gga cat tgc 312
 His Phe Val Gly Val Gly His Cys
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<210> 4

<211> 104

<212> PRT

<213> Artificial Sequence

<400> 4

Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg Asp
 1 5 10 15

Val Asp Cys Asn Asn Ile Leu Ser Thr Asn Leu Phe His Cys Lys Asp
 20 25 30

Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile Cys
 35 40 45

Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Phe Glu Phe Tyr
 50 55 60

Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu Lys
 65 70 75 80

Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro Val
 85 90 95

His Phe Val Gly Val Gly His Cys
 100

<210> 5

<211> 315

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana pipiens
 ribonuclease with Met at position 1 (recombinant
 Met(-1) RaPLR1)

<220>

<221> CDS

<222> (1)..(315)

<223> Met(-1) RaPLR1

<400> 5
 atg caa gac tgg ctt acg ttt cag aag aag cac ctg aca aac acc cgg 48
 Met Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg
 1 5 10 15

gat gtt gac tgt aat aat atc atg tca aca aac ttg ttc cac tgc aag 96
 Asp Val Asp Cys Asn Asn Ile Met Ser Thr Asn Leu Phe His Cys Lys
 20 25 30

gac aag aac act ttt atc tat tca cgt cct gag cca gtg aag gcc atc 144
 Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile
 35 40 45

tgt aaa gga att ata gcc tcc aaa aat gtg tta act acc tct gag ttt 192
 Cys Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe
 50 55 60

tat ctc tct gat tgc aat gta aca agc agg cct tgc aag tat aaa tta 240
 Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu
 65 70 75 80

aag aaa tca act aat aca ttt tgt gta act tgt gag aat caa gct cca 288
 Lys Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro
 85 90 95

gta cat ttc gtg ggt gtc gga cat tgc 315
 Val His Phe Val Gly Val Gly His Cys
 100 105

<210> 6
 <211> 105
 <212> PRT
 <213> Artificial Sequence

<400> 6
 Met Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg
 1 5 10 15

Asp Val Asp Cys Asn Asn Ile Met Ser Thr Asn Leu Phe His Cys Lys
 20 25 30

Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile
 35 40 45

Cys Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe
 50 55 60

Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu
 65 70 75 80

Lys Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro
 85 90 95

Val His Phe Val Gly Val Gly His Cys
 100 105

<210> 7
 <211> 315
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana pipiens
 ribonuclease with Met at position 1 and Met24Leu
 substitution (recombinant Met(-1) RaPLR1 Met23Leu)

<220>
 <221> CDS
 <222> (1)..(315)
 <223> Met(-1) RaPLR1 Met23Leu

<400> 7
 atg caa gac tgg ctt acg ttt cag aag aag cac ctg aca aac acc cgg 48
 Met Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg
 1 5 10 15
 gat gtt gac tgt aat aat atc ctg tca aca aac ttg ttc cac tgc aag 96
 Asp Val Asp Cys Asn Asn Ile Leu Ser Thr Asn Leu Phe His Cys Lys
 20 25 30
 gac aag aac act ttt atc tat tca cgt cct gag cca gtg aag gcc atc 144
 Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile
 35 40 45
 tgt aaa gga att ata gcc tcc aaa aat gtg tta act acc ttt gag ttt 192
 Cys Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Phe Glu Phe
 50 55 60
 tat ctc tct gat tgc aat gta aca agc agg cct tgc aag tat aaa tta 240
 Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu
 65 70 75 80
 aag aaa tca act att aca ttt tgt gta act tgt gag aat caa gct cca 288
 Lys Lys Ser Thr Ile Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro
 85 90 95
 gta cat ttc gtg ggt gtc gga cat tgc 315
 Val His Phe Val Gly Val Gly His Cys
 100 105

<210> 8
 <211> 105
 <212> PRT
 <213> Artificial Sequence

<400> 8
 Met Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg
 1 5 10 15
 Asp Val Asp Cys Asn Asn Ile Leu Ser Thr Asn Leu Phe His Cys Lys
 20 25 30
 Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile
 35 40 45

Cys Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Phe Glu Phe
 50 55 60
 Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu
 65 70 75 80
 Lys Lys Ser Thr Ile Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro
 85 90 95
 Val His Phe Val Gly Val Gly His Cys
 100 105

<210> 9
 <211> 111
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana pipiens
 ribonuclease with (His)6 tag, Met at position 7
 and Met30Leu substitution (recombinant Met(-1)
 RaPLR1 Met23Leu-(His)6)

<400> 9
 His His His His His His Met Gln Asp Trp Leu Thr Phe Gln Lys Lys
 1 5 10 15
 His Leu Thr Asn Thr Arg Asp Val Asp Cys Asn Asn Ile Leu Ser Thr
 20 25 30
 Asn Leu Phe His Cys Lys Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro
 35 40 45
 Glu Pro Val Lys Ala Ile Cys Lys Gly Ile Ile Ala Ser Lys Asn Val
 50 55 60
 Leu Thr Thr Phe Glu Phe Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg
 65 70 75 80
 Pro Cys Lys Tyr Lys Leu Lys Lys Ser Thr Ile Thr Phe Cys Val Thr
 85 90 95
 Cys Glu Asn Gln Ala Pro Val His Phe Val Gly Val Gly His Cys
 100 105 110

<210> 10
 <211> 312
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana pipiens
 ribonuclease with Gln1Ser substitution
 (recombinant RaPLR1 Q1S)

<220>
 <221> CDS
 <222> (1) .. (312)
 <223> RaPLR1 Q1S

<400> 10
 tca gac tgg ctt acg ttt cag aag aag cac ctg aca aac acc cgg gat 48
 Ser Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg Asp
 1 5 10 15
 gtt gac tgt aat aat atc atg tca aca aac ttg ttc cac tgc aag gac 96
 Val Asp Cys Asn Asn Ile Met Ser Thr Asn Leu Phe His Cys Lys Asp
 20 25 30
 aag aac act ttt atc tat tca cgt cct gag cca gtg aag gcc atc tgt 144
 Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile Cys
 35 40 45
 aaa gga att ata gcc tcc aaa aat gtg tta act acc tct gag ttt tat 192
 Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe Tyr
 50 55 60
 ctc tct gat tgc aat gta aca agc agg cct tgc aag tat aaa tta aag 240
 Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu Lys
 65 70 75 80
 aaa tca act aat aca ttt tgt gta act tgt gag aat caa gct cca gta 288
 Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro Val
 85 90 95
 cat ttc gtg ggt gtc gga cat tgc 312
 His Phe Val Gly Val Gly His Cys
 100

<210> 11
 <211> 104
 <212> PRT
 <213> Artificial Sequence

<400> 11
 Ser Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg Asp
 1 5 10 15
 Val Asp Cys Asn Asn Ile Met Ser Thr Asn Leu Phe His Cys Lys Asp
 20 25 30
 Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile Cys
 35 40 45
 Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe Tyr
 50 55 60
 Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu Lys
 65 70 75 80
 Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro Val
 85 90 95
 His Phe Val Gly Val Gly His Cys
 100

<210> 12
 <211> 315
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana pipiens
 ribonuclease with Met at position 1 and Gln2Ser
 substitution (recombinant Met(-1) RaPLR1 Q1S)

<220>
 <221> CDS
 <222> (1)..(315)
 <223> Met(-1) RaPLR1 Q1S

<400> 12
 atg tca gac tgg ctt acg ttt cag aag aag cac ctg aca aac acc cgg 48
 Met Ser Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg
 1 5 10 15
 gat gtt gac tgt aat aat atc atg tca aca aac ttg ttc cac tgc aag 96
 Asp Val Asp Cys Asn Asn Ile Met Ser Thr Asn Leu Phe His Cys Lys
 20 25 30
 gac aag aac act ttt atc tat tca cgt cct gag cca gtg aag gcc atc 144
 Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile
 35 40 45
 tgt aaa gga att ata gcc tcc aaa aat gtg tta act acc tct gag ttt 192
 Cys Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe
 50 55 60
 tat ctc tct gat tgc aat gta aca agc agg cct tgc aag tat aaa tta 240
 Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu
 65 70 75 80
 aag aaa tca act aat aca ttt tgt gta act tgt gag aat caa gct cca 288
 Lys Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro
 85 90 95
 gta cat ttc gtg ggt gtc gga cat tgc 315
 Val His Phe Val Gly Val Gly His Cys
 100 105

<210> 13
 <211> 105
 <212> PRT
 <213> Artificial Sequence

<400> 13
 Met Ser Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg
 1 5 10 15
 Asp Val Asp Cys Asn Asn Ile Met Ser Thr Asn Leu Phe His Cys Lys
 20 25 30
 Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile
 35 40 45

Cys Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe
 50 55 60
 Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu
 65 70 75 80
 Lys Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro
 85 90 95
 Val His Phe Val Gly Val Gly His Cys
 100 105

<210> 14
 <211> 330
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana
 catesbeiana oocyte ribonuclease (RaCOR1) synthetic
 gene modified to use E. coli preferred codons

<220>
 <221> CDS
 <222> (1)..(330)
 <223> RaCOR1 for E. coli expression system

<400> 14
 cag aac tgg gct act ttc cag cag aaa cat atc atc aac act ccg atc 48
 Gln Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro Ile
 1 5 10 15
 atc tgc aac act atc atg gac aac aac atc tac atc gtt ggt ggt cag 96
 Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly Gln
 20 25 30
 tgc aaa cgt gtt aac act ttc atc atc tct tct gct act act gtt aaa 144
 Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Thr Val Lys
 35 40 45
 gct atc tgc act ggt gtt atc aac atg aac gtt ctg tct act act cgt 192
 Ala Ile Cys Thr Gly Val Ile Asn Met Asn Val Leu Ser Thr Thr Arg
 50 55 60
 ttc cag ctg aac act tgc act cgt act tct atc act ccg cgt ccg tgc 240
 Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro Cys
 65 70 75 80
 ccg tac tct tct cgt act gaa act aac tac atc tgc gtt aaa tgc gaa 288
 Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys Glu
 85 90 95
 aac cag tac ccg gtt cat ttc gct ggt atc ggt cgt tgc ccg 330
 Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro
 100 105 110

<210> 15
 <211> 110
 <212> PRT
 <213> Artificial Sequence

<400> 15
 Gln Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro Ile
 1 5 10 15
 Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly Gln
 20 25 30
 Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Thr Val Lys
 35 40 45
 Ala Ile Cys Thr Gly Val Ile Asn Met Asn Val Leu Ser Thr Thr Arg
 50 55 60
 Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro Cys
 65 70 75 80
 Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys Glu
 85 90 95
 Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro
 100 105 110

<210> 16
 <211> 333
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease with Met at position 1
 (recombinant Met(-1) RaCOR1)

<220>
 <221> CDS
 <222> (1)..(333)
 <223> Met(-1) RaCOR1

<400> 16
 atg cag aac tgg gct act ttc cag cag aaa cat atc atc aac act ccg 48
 Met Gln Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro
 1 5 10 15
 atc atc tgc aac act atc atg gac aac aac atc tac atc gtt ggt ggt 96
 Ile Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly
 20 25 30
 cag tgc aaa cgt gtt acc act ttc atc atc tct tct gct act act gtt 144
 Gln Cys Lys Arg Val Thr Thr Phe Ile Ile Ser Ser Ala Thr Thr Val
 35 40 45
 aaa gct atc tgc act ggt gtt atc aac atg aac gtt ctg tct act act 192
 Lys Ala Ile Cys Thr Gly Val Ile Asn Met Asn Val Leu Ser Thr Thr
 50 55 60

cgt ttc cag ctg aac act tgc act cgt act tct atc act ccg cgt ccg 240
 Arg Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro
 65 70 75 80

tgc ccg tac tct tct cgt act gaa act aac tac atc tgc gtt aaa tgc 288
 Cys Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys
 85 90 95

gaa aac cag tac ccg gtt cat ttc gct ggt atc ggt cgt tgc ccg 333
 Glu Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro
 100 105 110

<210> 17
 <211> 111
 <212> PRT
 <213> Artificial Sequence

<400> 17
 Met Gln Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro
 1 5 10 15

Ile Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly
 20 25 30

Gln Cys Lys Arg Val Thr Thr Phe Ile Ile Ser Ser Ala Thr Thr Val
 35 40 45

Lys Ala Ile Cys Thr Gly Val Ile Asn Met Asn Val Leu Ser Thr Thr
 50 55 60

Arg Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro
 65 70 75 80

Cys Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys
 85 90 95

Glu Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro
 100 105 110

<210> 18
 <211> 330
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease with Met22Leu and
 Met75Leu substitutions (recombinant RaCOR1
 Met22Leu Met57Leu)

<220>
 <221> CDS
 <222> (1)..(330)
 <223> RaCOR1 Met22Leu Met57Leu

<400> 18
 cag aac tgg gct act ttc cag cag aaa cat atc atc aaa act ccg atc 48
 Gln Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Lys Thr Pro Ile
 1 5 10 15

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atc tgc aac act atc ctg gac aac aac atc tac atc gtt ggt ggt cag 96
Ile Cys Asn Thr Ile Leu Asp Asn Asn Ile Tyr Ile Val Gly Gly Gln
                20                      25                      30

tgc aaa cgt gtt aac act ttc atc atc tct tct gct act act gtt aaa 144
Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Thr Val Lys
                35                      40                      45

gct atc tgc act ggt gtt atc aac ctg aac gtt ctg tct act act cgt 192
Ala Ile Cys Thr Gly Val Ile Asn Leu Asn Val Leu Ser Thr Thr Arg
                50                      55                      60

ttc cag ctg aac act tgc act cgt act tct atc act ccg cgt ccg tgc 240
Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro Cys
                65                      70                      75                      80

ccg tac tct tct cgt act gaa act aac tac atc tgc gtt aaa tgc gaa 288
Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys Glu
                85                      90                      95

aac cag tac ccg gtt cat ttc gct ggt atc ggt cgt tgc ccg 330
Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro
                100                      105                      110

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<210> 19
<211> 110
<212> PRT
<213> Artificial Sequence

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<400> 19
Gln Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Lys Thr Pro Ile
 1                5                10                15

Ile Cys Asn Thr Ile Leu Asp Asn Asn Ile Tyr Ile Val Gly Gly Gln
                20                25                30

Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Thr Val Lys
                35                40                45

Ala Ile Cys Thr Gly Val Ile Asn Leu Asn Val Leu Ser Thr Thr Arg
                50                55                60

Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro Cys
                65                70                75                80

Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys Glu
                85                90                95

Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro
                100                105                110

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<210> 20
<211> 333
<212> DNA
<213> Artificial Sequence

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<220>

<223> Description of Artificial Sequence:Rana
catesbeiana ribonuclease with Met at position 1,
Met23Leu and Met58Leu substitutions (recombinant
Met(-1) RaCOR1 Met22Leu Met57Leu)

<220>

<221> CDS

<222> (1)..(333)

<223> Met(-1) RaCOR1 Met22Leu Met57Leu

<400> 20

atg	cag	aac	tgg	gct	act	ttc	cag	cag	aaa	cat	atc	atc	aac	act	ccg	48
Met	Gln	Asn	Trp	Ala	Thr	Phe	Gln	Gln	Lys	His	Ile	Ile	Asn	Thr	Pro	
1				5					10					15		
atc	atc	tgc	aac	act	atc	ctg	gac	aac	aac	atc	tac	atc	gtt	ggt	ggt	96
Ile	Ile	Cys	Asn	Thr	Ile	Leu	Asp	Asn	Asn	Ile	Tyr	Ile	Val	Gly	Gly	
			20					25					30			
cag	tgc	aaa	cgt	gtt	aac	act	ttc	atc	atc	tct	tct	gct	act	act	gtt	144
Gln	Cys	Lys	Arg	Val	Asn	Thr	Phe	Ile	Ile	Ser	Ser	Ala	Thr	Thr	Val	
			35				40					45				
aaa	gct	atc	tgc	act	ggt	gtt	atc	aac	ctg	aac	gtt	ctg	tct	act	act	192
Lys	Ala	Ile	Cys	Thr	Gly	Val	Ile	Asn	Leu	Asn	Val	Leu	Ser	Thr	Thr	
	50					55					60					
cgt	ttc	cag	ctg	aac	act	tgc	act	cgt	act	tct	atc	act	ccg	cgt	ccg	240
Arg	Phe	Gln	Leu	Asn	Thr	Cys	Thr	Arg	Thr	Ser	Ile	Thr	Pro	Arg	Pro	
65					70					75					80	
tgc	ccg	tac	tct	tct	cgt	act	gaa	act	aac	tac	atc	tgc	gtt	aaa	tgc	288
Cys	Pro	Tyr	Ser	Ser	Arg	Thr	Glu	Thr	Asn	Tyr	Ile	Cys	Val	Lys	Cys	
				85					90					95		
gaa	aac	cag	tac	ccg	gtt	cat	ttc	gct	ggt	atc	ggt	cgt	tgc	ccg		333
Glu	Asn	Gln	Tyr	Pro	Val	His	Phe	Ala	Gly	Ile	Gly	Arg	Cys	Pro		
			100					105					110			

<210> 21

<211> 111

<212> PRT

<213> Artificial Sequence

<400> 21

Met	Gln	Asn	Trp	Ala	Thr	Phe	Gln	Gln	Lys	His	Ile	Ile	Asn	Thr	Pro
1				5					10					15	
Ile	Ile	Cys	Asn	Thr	Ile	Leu	Asp	Asn	Asn	Ile	Tyr	Ile	Val	Gly	Gly
			20					25					30		
Gln	Cys	Lys	Arg	Val	Asn	Thr	Phe	Ile	Ile	Ser	Ser	Ala	Thr	Thr	Val
			35				40					45			
Lys	Ala	Ile	Cys	Thr	Gly	Val	Ile	Asn	Leu	Asn	Val	Leu	Ser	Thr	Thr
	50					55				60					
Arg	Phe	Gln	Leu	Asn	Thr	Cys	Thr	Arg	Thr	Ser	Ile	Thr	Pro	Arg	Pro
65					70					75				80	

Cys Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys
 85 90 95

Glu Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro
 100 105 110

<210> 22
 <211> 117
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease with (His)6 tag, Met at
 position 7, Met23Leu and Met58Leu substitutions
 (recombinant Met(-1) RaCOR1 Met22Leu Met57Leu-(His)6)

<400> 22
 His His His His His Met Gln Asn Trp Ala Thr Phe Gln Gln Lys
 1 5 10 15
 His Ile Ile Asn Thr Pro Ile Ile Cys Asn Thr Ile Leu Asp Asn Asn
 20 25 30
 Ile Tyr Ile Val Gly Gly Gln Cys Lys Arg Val Asn Thr Phe Ile Ile
 35 40 45
 Ser Ser Ala Thr Thr Val Lys Ala Ile Cys Thr Gly Val Ile Asn Leu
 50 55 60
 Asn Val Leu Ser Thr Thr Arg Phe Gln Leu Asn Thr Cys Thr Arg Thr
 65 70 75 80
 Ser Ile Thr Pro Arg Pro Cys Pro Tyr Ser Ser Arg Thr Glu Thr Asn
 85 90 95
 Tyr Ile Cys Val Lys Cys Glu Asn Gln Tyr Pro Val His Phe Ala Gly
 100 105 110
 Ile Gly Arg Cys Pro
 115

<210> 23
 <211> 330
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease with Gln1Ser substitution
 (recombinant RaCOR1 Q1S)

<220>
 <221> CDS
 <222> (1)..(330)
 <223> RaCOR1 Q1S

<400> 23

tca aac tgg gct act ttc cag cag aaa cat atc atc aac act ccg atc	48
Ser Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro Ile	
1 5 10 15	
atc tgc aac act atc atg gac aac aac atc tac atc gtt ggt ggt cag	96
Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly Gln	
20 25 30	
tgc aaa cgt gtt aac act ttc atc atc tct tct gct act act gtt aaa	144
Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Val Lys	
35 40 45	
gct atc tgc act ggt gtt atc aac atg aac gtt ctg tct act act cgt	192
Ala Ile Cys Thr Gly Val Ile Asn Met Asn Val Leu Ser Thr Thr Arg	
50 55 60	
ttc cag ctg aac act tgc act cgt act tct atc act ccg cgt ccg tgc	240
Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro Cys	
65 70 75 80	
ccg tac tct tct cgt act gaa act aac tac atc tgc gtt aaa tgc gaa	288
Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys Glu	
85 90 95	
aac cag tac ccg gtt cat ttc gct ggt atc ggt cgt tgc ccg	330
Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro	
100 105 110	

<210> 24

<211> 110

<212> PRT

<213> Artificial Sequence

<400> 24

Ser Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro Ile	
1 5 10 15	
Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly Gln	
20 25 30	
Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Thr Val Lys	
35 40 45	
Ala Ile Cys Thr Gly Val Ile Asn Met Asn Val Leu Ser Thr Thr Arg	
50 55 60	
Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro Cys	
65 70 75 80	
Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys Glu	
85 90 95	
Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro	
100 105 110	

<210> 25
 <211> 333
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease with Met at position 1
 and Gln2Ser substitution

<220>

<221> CDS

<222> ()..(333)

<223> Met(-1) RaCOR1 Q1S

<400> 25

atg tca aac tgg gct act ttc cag cag aaa cat atc atc aac act ccg	48
Met Ser Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro	
1 5 10 15	
atc atc tgc aac act atc atg gac aac aac atc tac atc gtt ggt ggt	96
Ile Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly	
20 25 30	
cag tgc aaa cgt gtt aac act ttc atc atc tct tct gct act act gtt	144
Gln Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Thr Val	
35 40 45	
aaa gct atc tgc act ggt gtt atc aac atg aac gtt ctg tct act act	192
Lys Ala Ile Cys Thr Gly Val Ile Asn Met Asn Val Leu Ser Thr Thr	
50 55 60	
cgt ttc cag ctg aac act tgc act cgt act tct atc act ccg cgt ccg	240
Arg Phe Gln Leu Asn Thr Cys Thr Arg Thr Ser Ile Thr Pro Arg Pro	
65 70 75 80	
tgc ccg tac tct tct cgt act gaa act aac tac atc tgc gtt aaa tgc	288
Cys Pro Tyr Ser Ser Arg Thr Glu Thr Asn Tyr Ile Cys Val Lys Cys	
85 90 95	
gaa aac cag tac ccg gtt cat ttc gct ggt atc ggt cgt tgc ccg	333
Glu Asn Gln Tyr Pro Val His Phe Ala Gly Ile Gly Arg Cys Pro	
100 105 110	

<210> 26
 <211> 111
 <212> PRT
 <213> Artificial Sequence

<400> 26

Met Ser Asn Trp Ala Thr Phe Gln Gln Lys His Ile Ile Asn Thr Pro	
1 5 10 15	
Ile Ile Cys Asn Thr Ile Met Asp Asn Asn Ile Tyr Ile Val Gly Gly	
20 25 30	
Gln Cys Lys Arg Val Asn Thr Phe Ile Ile Ser Ser Ala Thr Thr Val	
35 40 45	


```
<210> 27
<211> 2855
<212> DNA
<213> Rana pipiens
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<220>
<223> Rana pipiens ribonuclease (RaPLR1) Clone 5a1b cDNA
insert

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<220>
<221> CDS
<222> (97) .. (481)
<223> RaPLR1
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<220>
<221> sig_peptide
<222> (97)..(165)
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<400> 27																
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tctctttatat ataaaaggcct gatcacgact tccaga atg ttt cca aaa ttc tca																114
Met Phe Pro Lys Phe Ser																
1 5																
ttt ctc ctg ata ttt gca gtt gtt ttg agt ctc act cat aag tcc tta																162
Phe Leu Leu Ile Phe Ala Val Val Leu Ser Leu Thr His Lys Ser Leu																
10 15 20																
tgt caa gac tgg ctt acg ttt cag aag aag cac ctg aca aac acc cgg																210
Cys Gln Asp Trp Leu Thr Phe Gln Lys Lys His Leu Thr Asn Thr Arg																
25 30 35																
gat gtt gac tgt aat aat atc atg tca aca aac ttg ttc cac tgc aag																258
Asp Val Asp Cys Asn Asn Ile Met Ser Thr Asn Leu Phe His Cys Lys																
40 45 50																
gac aag aac act ttt atc tat tca cgt cct gag cca gtg aag gcc atc																306
Asp Lys Asn Thr Phe Ile Tyr Ser Arg Pro Glu Pro Val Lys Ala Ile																
55 60 65 70																
tgt aaa gga att ata gcc tcc aaa aat gtg tta act acc tct gag ttt																354
Cys Lys Gly Ile Ile Ala Ser Lys Asn Val Leu Thr Thr Ser Glu Phe																
75 80 85																
tat ctc tct gat tgc aat gta aca agc agg cct tgc aag tat aaa tta																402
Tyr Leu Ser Asp Cys Asn Val Thr Ser Arg Pro Cys Lys Tyr Lys Leu																
90 95 100																

aag aaa tca act aat aca ttt tgt gta act tgt gag aat caa gct cca 450
Lys Lys Ser Thr Asn Thr Phe Cys Val Thr Cys Glu Asn Gln Ala Pro
105 110 115

gta cat ttc gtg ggt gtc gga cat tgc tagaaatatg tttgacaaca 497
Val His Phe Val Gly Val Gly His Cys
120 125

gggatgtgat aagcagctgc aagaaattat tttgaagtga atttactaaa gacactaatt 557
ttgcataaat tttccccaga gcttaccggt agtaagaaaa ttccaacagg gagccaagca 617
cagaaagtaa actaaggagc caaagtaatt ataaaagtca cactggaccg ctgctactgc 677
actcagatga ccaaatgaga aacagacaaa aacagcagag ttgggaagcg cagatccggg 737
aggtggcggg gagtcaattg gggatggagt ccatgtgaga tttggaaccg tttgttgctg 797
gtgaagcatg tggccggtgc acagtacaca tggggaaaga tagtcggatt ggccgggctc 857
gctgtggtgg tgccggcggg tgagccaaag gtggtgggga gatggctgtc ccccttctg 917
tgggggctgt ggacagaggg agctgcggac caggggtggg aggcttgag agaattttca 977
aacagctgac gtggccgggg ctgggcagca tcggggaggg gaagggctgg gctcagatcc 1037
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gagaccagag ggatctgtgc ccagcctttc ccctccctga tgtggcccggt ttttggttat 1157
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tgctggcact gtgcagcga gtttggccag tcatggtc ttttcccatt tgtcatgtgt 1337
gttggttgca tgttttgtcg gcggtggact gttttgaatt tcacatggat tccatcttcg 1397
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agtggatgca gtgaaactct ggtgattacc atcatccaat catgtgcaag aaaaaatatt 1517
ttcatatttc ttccacccaa ttgggtattc attaggaagt ttgagcacat tcacgttcta 1577
gggaaaatga gtgcaactgc acttccaaag ttcacagtct atttgccttt agtaaatacca 1637
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atatgtttta ccttaaagtg gaagtaaact tctatcacta aattttacct ataggtgaga 1877
cccatgcgct cttcaggaat ggccgctggg gctgttcctt cagagccctg tgctgcgaac 1937
ggcggctccc gtgtgcatgt acaggagtga cgtcatcaca gctccggcca gtcacagagt 1997
tagagttcaa gtgtgagtgg cttgagccac gatgatgtcg ctcccaaaca tgtgtgcggg 2057
ggtctccggt tgccggcgag gacactgggg gaatagcatg ggtgtgccgt tccttcagag 2117

catatgcgtg ggtgacgtca ctagctgcat ctaaagtaat atctcctaaa caatgcacat 2177
ttaggagata gttacagtac ctatgggtaa gccttattgt aggcttacct ataggtaaaa 2237
atcatgcatg ggagtttact tccatgtagg gatgaggaga gcaggctgac atattaaagt 2297
aaaaatctta cctatgtagg gatgaggaga gcaggctgac atattaaagt aaaaatctta 2357
cctatagtgg ttgaaagtag ttgaaaataa gatggcctgc agggctctta aaaggctagg 2417
atagcacagt atccacatga ggcaccagat ctcgctcccc cacacatgag tagcaaggag 2477
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aggacgatca gagagatgct cagatctgcc cgaaggagaa aggtggaaac atccattcaa 2657
tgtcatatgc ctaaagaagc caccacat aaaaagttaa tagatcatca ggtggcagcc 2717
aaccacacca ggcccaaagg aggggtggccc cagtgaaccg tataggaaca gcactcagct 2777
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aaaaaaaaa aaaaaaaaaa 2855

<210> 28

<211> 127

<212> PRT

<213> Rana pipiens

<400> 28

Met	Phe	Pro	Lys	Phe	Ser	Phe	Leu	Leu	Ile	Phe	Ala	Val	Val	Leu	Ser	1	5	10	15
Leu	Thr	His	Lys	Ser	Leu	Cys	Gln	Asp	Trp	Leu	Thr	Phe	Gln	Lys	Lys	20	25	30	
His	Leu	Thr	Asn	Thr	Arg	Asp	Val	Asp	Cys	Asn	Asn	Ile	Met	Ser	Thr	35	40	45	
Asn	Leu	Phe	His	Cys	Lys	Asp	Lys	Asn	Thr	Phe	Ile	Tyr	Ser	Arg	Pro	50	55	60	
Glu	Pro	Val	Lys	Ala	Ile	Cys	Lys	Gly	Ile	Ile	Ala	Ser	Lys	Asn	Val	65	70	75	80
Leu	Thr	Thr	Ser	Glu	Phe	Tyr	Leu	Ser	Asp	Cys	Asn	Val	Thr	Ser	Arg	85	90	95	
Pro	Cys	Lys	Tyr	Lys	Leu	Lys	Lys	Ser	Thr	Asn	Thr	Phe	Cys	Val	Thr	100	105	110	
Cys	Glu	Asn	Gln	Ala	Pro	Val	His	Phe	Val	Gly	Val	Gly	His	Cys	115	120	125		

<210> 29
 <211> 4
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:CAAX motif to
 target heterologous proteins to the plasma
 membrane, where A = aliphatic amino acid and
 X = Ser, Met, Cys, Ala or Gln

<400> 29
 Cys Val Ile Met
 1

<210> 30
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana pipiens
 Onconase degenerate forward primer

<400> 30
 aagratgtkg attgygataa yatcatg

27

<210> 31
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana pipiens
 Onconase degenerate reverse primer

<400> 31
 aaartgmacw ggkgcctgrt tytcaca

27

<210> 32
 <211> 96
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 32
 cagaactggg ctactttcca gcagaaacat atcatcaaca ctccgatcat ctgcaacact 60
 atcatggaca acaacatcta catcgttggg ggtcag

96

<210> 33
 <211> 86
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 33
 tacatcggtg gtgggtcagtg caaacgtgtt aacactttca tcattctctt gctactactg 60
 ttaaactgtat ctgcactggt gttatc 86

<210> 34
 <211> 96
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 34
 atctgcactg gtgttactaa catgaacgtt ctgtctacta ctcgtttcca gctgaacact 60
 tgcactcgta cttctatcac tccgcgtccg tgcccg 96

<210> 35
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 35
 gttgataaca ccagtgcaga t 21

<210> 36
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 36
 atctgcactg gtgttatcaa c 21

<210> 37
 <211> 95
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 37
 actccgcgtc cgtgcccgtg ctcttctcgt actgaaacta actacatctg cgttaaactgc 60
 gaaaaccagt acccggttca tttcgctggt atcgg 95

<210> 38
 <211> 71
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 38
 atatatctag aaataatttt atttaacttt aagaaggaga tatacatatg cagaactggg 60
 ctactttcca g 71

<210> 39
 <211> 48
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 39
 cgcgcggat ccctactacg ggcaacgacc gataccagcg aaatgaac 48

<210> 40
 <211> 96
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 40
 cagaactggg ctactttcca gcagaaacat atcatcaaca ctccgatcat ctgcaacact 60
 atcctgcaga acaacatcta catcggttggg ggtagc 96

<210> 41
 <211> 96
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana ribonuclease synthetic gene (RaCOR1)
 oligonucleotide

<400> 41
 atctgcactg gtgttatcaa cctgaacgtt ctgtctacta ctcgtttcca gctgaacact 60
 tgcactcgta cttctatcac tccgcgtccg tgcccg 96

<210> 42
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Rana
 catesbeiana insertion primer for NdeI restriction
 site

<400> 42
 ggattccata tgcagaactg ggctattttc cag 33

<210> 43
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:six histidine
 residue tag at amino terminus

<400> 43
 His His His His His His
 1 5